

REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections and further examination are requested. Upon entry of this amendment, the specification is amended, the abstract is amended, claims 1, 3 and 6 are amended, and claim 2, 4, 5, 11 and 12 are cancelled, leaving claims 1, 3, 6-10, 13 and 14 pending with claims 1 and 3 being independent. No new matter has been added.

Drawing Objections

The drawings have been objected under 37 CFR 1.83(a). The Examiner states that the drawings must show every feature of the invention specified in the claims. Specifically, the Examiner states that the "radially inner side of the flange portion is made of a thick resin and a radially outer side there of is made of a thinner resin than the thick resin" must be shown or the features cancelled from the claims.

Applicants respectfully request that this objection be withdrawn, since this feature has been cancelled from the claims.

Specification

The specification and abstract have been carefully reviewed and revised to correct grammatical and idiomatic errors in order to aid the Examiner in further consideration of the application. No new matter has been added.

Rejections Under 35 U.S.C. §112, second paragraph

Claims 3-5 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4 and 5 have been cancelled. Therefore, this rejection is moot with respect to these claims.

The Examiner states that the terms "apart" and "coming closer to an opposed face in a radially outward direction" in claim 3 are unclear. Claim 3 has been amended to overcome this rejection.

Rejections Under 35 U.S.C. §102(b)

Claims 1 and 2 have been rejected under 35 U.S.C. §102(b) as being anticipated by Takanobu et al. (JP 02-278007).

Claim 2 has been cancelled and Applicants submit that claim 1 as now pending overcomes this rejection. Specifically, amended independent claim 1 recites a dynamic bearing device comprising a thrust bearing gap having a uniform portion with a constant width formed on an inner diameter side of a reduced portion.

The cited prior art fails to disclose or render obvious such a device. In particular, Takanobu discloses a thrust bearing in which the depths of dynamic pressure generating grooves are varied according to the size of the thrust bearing gap, so that the torque for actuation and halt is reduced and a constant pumping effect is obtained from the dynamic pressure generating grooves. In Takanobu, the depths of the grooves are varied so that the pumping effect of the thrust bearing gap is constant. Thus, it is clear that Takanobu is distinct from the present invention. Specifically, the present invention, as recited in claim 1, provides the maximum pumping power at the outermost diameter portion of the thrust bearing gap by dynamic pressure generating grooves having constant depths.

Thus, in the present invention as recited in claim 1, a wide uniform portion is configured at the inner diameter side of the reduced portion, so that the torque that is lost at the thrust bearing gap during the rotation of the shaft can be reduced. Fig. 4 of Takanobu clearly discloses that the gap is wider at the inner diameter side of the reduced portion, but the area on the inner diameter side is spherically recessed. Accordingly, the torque loss is greater there compared with the uniform portion having a constant width.

Therefore, Applicants submit that Takanobu fails to disclose or render obvious all of the elements of claim 1. Moreover, there is no reasoning in the prior art to modify Takanobu such that it would have rendered claim 1 obvious. Thus, Applicants submit that independent claim 1 and its dependent claims are allowable over the cited prior art.

Claims 1, 2, 8 and 9 have been rejected under 35 U.S.C. §102(b) as being anticipated by Ouchi et al. (JP 10-269691).

Applicants submit that amended independent claim 1 is allowable over Ouchi. As illustrated in Figs 8-10 of Ouchi, a plurality of bent grooves 131c, 142c, and 151c are provided on lower surfaces of rotation thrust plates 131 and 151 and an upper surface of the bearing portion 142. In these structures, the lubricating fluid runs toward the outer diameter side to collect at bent portions 131d, 142d, and 151d in bent grooves while the rotation thrust plates are rotating. Thus, the lubricating fluid is compressed the most at the bent portions, causing high pressure. In contrast, claim 1 recites a dynamic bearing device comprising, a reduced portion having an axial width decreasing in a radially outward direction disposed in the thrust bearing gap, the reduced portion being formed by an inclined plane provided at the thrust bearing surface, the plurality of dynamic pressure generating grooves being disposed on the inclined plane, a pumping power of the dynamic pressure generating grooves is maximized in a radially outermost portion of the reduced portion, and the thrust bearing gap having a uniform portion with a constant width formed on an inner diameter side of the reduced portion (*see* lines 10 to 11 on page 19 of the specification).

Applicants submit that Ouchi fails to disclose any portion corresponding to the recited uniform portion. Moreover, there is no reasoning in the prior art to modify Ouchi such that it would have rendered claim 1 obvious. Thus, Applicants submit that independent claim 1 and its dependent claims are allowable over the cited prior art.

Rejections Under 35 U.S.C. §103(a)

Claims 6 and 13 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Ouchi as applied to claim 2 above.

Applicants submit that claims 6 and 13 are allowable over the cited prior art for the reasons set forth above, since each claim is dependent from independent claim 1

Claims 3, 4, 7, 10, 11 and 14 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Ouchi in view of Imae (JP 2003184868).

Applicants submit that claims 3, 4, 7, 10, 11 and 14 as now pending are allowable over this combination of references. Specifically, amended independent claim 3 now recites the subject matter of dependent claim 5

Claims 5 and 12 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Ouchi in view of Imae as applied to claim 4 above, and further in view of Nakagawa et al. (U.S. 2002/0172438).

In the rejection of claim 5, the Examiner recognizes that the combination of Ouchi and Imae fails to disclose a shaft member including an outer shaft portion forming an outer peripheral face of the shaft portion, an inner shaft portion provided on an inner periphery of the outer shaft portion, and the inner shaft portion and the flange portion being integrally formed of a resin. For these elements, the Examiner relies on Nakagawa.

However, Applicants submit that amended claim 3 (including the subject matter of claim 5) recites a dynamic bearing device comprising an inner shaft portion and a flange portion that are integrally formed of a resin, an axial thickness of the resin of the inner shaft portion being thicker than the flange portion on an outer diameter side of the flange portion. Thus, as described at lines 16 to 22 on page 26 of the specification of the present application, the invention, as recited in amended claim 3, provides the effect that "the inclined plane 17 can be formed by making use of a difference in the amount of sink simultaneously with the resin hardening."

Nakagawa fails to disclose such a device. In particular, Nakagawa discloses plugging the lower end of a stainless pipe 61 with a resin body 62, but Nakagawa fails to disclose an axial thickness of the resin of the inner shaft portion being thicker than the flange portion on an outer diameter side of the flange portion, as recited in claim 3.

Moreover, there is no reasoning in the prior art to modify Nakagawa, Ouchi or Imae or the combination thereof, such that this combination would have rendered claim 3 obvious. Thus, Applicants submit that independent claim 3 and its dependent claims are allowable over the cited prior art.

Conclusion

In view of the foregoing amendments and remarks, all of the claims now pending in this application are believed to be in condition for allowance. Reconsideration and favorable action are respectfully solicited.

Should the Examiner believe there are any remaining issues that must be resolved before this application can be allowed, it is respectfully requested that the Examiner contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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/Jeffrey J. Howell/

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